

# THE NAUTILUS.

---

---

Vol. XXXV

JULY, 1921.

No. 1

---

---

## RIVER BARRIERS TO AQUATIC ANIMALS.

BY CALVIN GOODRICH.

Contending that the genus was purely a creek form, Dr. James Lewis<sup>1</sup> questioned the existence of *Goniobasis* in the Holston river. Tryon,<sup>2</sup> with little waste of good-nature, retorted that Dr. Lewis was in no position to know about this, since the information upon which the assertion was based had to do with only twenty-five miles of the Holston.

Dr. Lewis seems to have glimpsed a fact in the distributional history of *Goniobasis*, but not all of the fact. The genus does exist in parts of the Holston, but it is where creek conditions obtain or river conditions are no more than beginning. It ceases to live in the true river. The twenty-five miles which had been painstakingly explored by Lewis's correspondent were apparently below the line of creek characteristics, within the barrier across which *Goniobasis* of the region could not go.

Dr. Paul Bartsch,<sup>3</sup> describing the restrictions which the sediment-laden Missouri places upon the distribution of the *Unionidæ*, remarks: "We have, therefore, the curious condi-

<sup>1</sup> *Amer. Jour. of Conchol.*, vol. vi, p. 216.

<sup>2</sup> *Ibid.*, vol. vii, p. 86.

<sup>3</sup> *Nautilus*, Dec., 1916.

tion of a river forming a barrier to aquatic animals." It may be of interest to recite similar instances as they apply to *Goniobasis*.

Say's *G. semicarinata* lives in streams upon both sides of the Ohio river. It does not, I am convinced, inhabit the river itself. Shells that one may identify as *semicarinata* have been sent out from Cincinnati, and it has been assumed that the material came from the Ohio. The collection of the University of Cincinnati leads me to believe that the shells were taken, not in the Ohio, but in the Little Miami river and in Mill creek, close at hand. A barrier is plainly indicated by the difference in the species on the two sides, the *semicarinata* of the Kentucky streams being smaller, darker, the carinæ less pronounced, than in Ohio and Indiana streams.

In the Blue river of southern Indiana, Daniels found a *Goniobasis* that Pilsbry described under the name *indianensis*. So far as the records show, the race is confined to that stream. In Hardin county, Ill., the streams of which are tributary to the Ohio, occurs a plicate *Goniobasis* which is identified as *costifera* Hald. In Pigeon creek at Evansville, Ind., I found a species of the genus which, if not new, is exceedingly rare in collections. It has no counterpart in streams explored elsewhere in Indiana and in Ohio and, so far as I know, in Kentucky and Illinois. To the list of isolated races of the region can be added *G. eliminata* Anth. In all these instances, the Ohio river has acted as a barrier, preventing the interbreeding of the races of one species, permitting the development of small, distinct races, acting as a wall between the interdistribution of the *Goniobases* of the Licking, Kentucky and Salt rivers on one part and of the Green river *Goniobases* on another.

*Goniobasis depygis* Say is recorded as from the Falls of the Ohio. I have collected there three times and never found specimens of the genus. None appears in the Daniels collection, and in a large sending from this locality to Dr. Bryant Walker, from Billups, there were no *Goniobases*. My own suspicion is that *depygis* is a *Lithasia* as surely as is the *G. louisvillensis* of Lea.

The characteristic *Goniobasis* of the upper Wabash river is *livescens* Menke, a species which, with the possible exception of *virginica* Gmel., is the most adaptive of all members of the genus. It appears as far down the river as Logansport. But somewhere below that point the conditions become inimical. It does not occur in the extensive collections made by Daniels in the Wabash at Lafayette. A small depauperate form was taken by Hinkley under stones at the "Chains" in Posey county, and he reports it also from Mt. Carmel, higher up the river. Its relationship is with *livescens*. We have here the case of a fairly robust species that has been isolated by river conditions but which, by reason of its adaptiveness, has been able to plant struggling colonies in an unfavorable environment, the colonies developing subspecific characters.

This isolating effect of river conditions is compactly illustrated at Big Stone Gap, Virginia. In a collection from the south fork of Powell river at this point — made without discriminating among species—*Pleurocera uncialis* Hald., a river form, was exceedingly abundant; *G. simplex* Say, a race of the creeks, was rare. In the north fork of the Powell, a smaller stream about a mile away, nearly 16 percent of the *Pleuroceridæ* were *simplex*, the rest *uncialis*. In a brook tributary to the south fork, 78 percent of the specimens taken were *simplex*, 22 percent *uncialis*. Near Arthur, Claiborne county, Tenn., the Powell seemed to contain no *Goniobases*. Conditions were suitable in the brook at Big Stone Gap. The genus survived, but under difficulties in the north fork of the Powell. The struggle was all but over in the south fork and, farther down stream, the isolation had been made complete.

The inhospitable nature of the true river to most species of *Goniobasis* may again be indicated by a quotation from a letter from Herbert H. Smith to Dr. Walker in November, 1909, writing while collecting at the Muscle (Mussel) Shoals of the Tennessee. "It is remarkable," Mr. Smith says, "that we have found no *Goniobasis* in the river except a few creek forms evidently washed in. The predominating genus is *Pleurocera*."

A great many forms of *Goniobasis* occur in east Tennessee.

Yet of all the species and in spite of their seemingly great powers for existing under such harsh conditions as those of flood, shifting stream bed and chemical erosion, none seems to have been able to survive the river conditions of the middle Tennessee. Not one, present study appears to show, has rounded Walden Ridge and become located in the streams of central Tennessee or of Alabama. Nor, the literature to the contrary, is there clear evidence that *Goniobases* characteristic of central Tennessee thrive east of the mountains.

---

**A NEW CHITON FROM SOUTHERN BRAZIL.**

BY W. H. DALL.

Among some shells sent for identification by Dr. Florentino Felippone of Montevideo is a chiton with quite unique sculpture, and a combination of characters which does not admit of its being placed in any of the subdivisions which have hitherto been proposed in the restricted group of Chitonidæ. I therefore suggest for it the following designation.

TYPHLOCHITON.

Chiton without dorsal eyes, the end valves with numerous slits, the intermediate valves with one slit on each side; the insertion plates externally grooved; the eaves not spongy; the gill rows long but not extending to either head or tail, the margin of the sinus entire.

Type:

TYPHLOCHITON FELIPPONEI n. sp.

Chiton with brownish velvety girdle with rare minute, short, silvery spicules sparsely irregularly distributed; gills about 25 on each side with the ends of the series separated by a marked vacant space from both head and tail; valves rather acutely ridged and medially posteriorly produced; the anterior valve with ten, the intermediate valves with one slit on each side, the tail valve with 12 slits; the eaves pale blue and not spongy; the insertion plates are radially sharply grooved